

PATENT
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high tuning material, and 300 or higher, for low tuning material. It also decreases with increasing the frequency, but even at higher frequencies say 30 GHz can take values as high as 100. A wide range of capacitance of the tunable dielectric capacitors is available, from 0.1 pF to several pF. The tunable dielectric capacitor is a packaged two-port component, in which a tunable dielectric can be voltage-controlled. The tunable film is deposited on a substrate, such as MgO, LaAlO₃, sapphire, Al₂O₃ or other dielectric substrates. An applied voltage produces an electric field across the tunable dielectric capacitor which produces an overall change in the capacitance of the tunable dielectric. Furtherer examples of tunable dielectric capacitors and their fabrication and uses are fully set forth in commonly owned Patent No. 6,686,817, co-pending application serial number 09/734,969, filed December 12, 2000, entitled "ELECTRONICALLY TUNABLE FILTERS WITH DIELECTRIC VARACTORS", to Yongfei Zhu et al. This patent application is incorporated in by reference.--

IN THE CLAIMS

Please amend the claims to read as follows:

1. (Currently Amended) A voltage-controlled tunable filter, comprising:
a plurality of coaxial combline resonators;
at least one of said plurality of coaxial combline resonators includes and at least one metallized through-hole;

an input/output coupling metallization on at least one surface of said plurality of coaxial combline resonators;

at least one voltage tunable dielectric varactor associated with said plurality of coaxial combline resonators; and

an iris with an aperture connecting said plurality of coaxial combline resonators.

2. (Original) The voltage-controlled tunable filter of claim 1, further comprising at least one DC biasing point for providing voltage to said at least one tunable varactor.

3. (Currently Amended) The voltage-controlled tunable filter of claim 1, wherein coupling between adjacent resonators is obtained via the aperture of said iris formed on a common wall between the resonators, and is controlled by the aperture of said iris size and position.

4. (Original) The voltage-controlled tunable filter of claim 1, wherein said at least one input/output coupling metallization on at least one surface of said at least one coaxial combline resonator is two input/output coupling metallizations on at least one surface of said at least one coaxial combline resonator.

5. (Original) The voltage-controlled tunable filter of claim 1, wherein said voltage-controlled tunable filter is a coaxial block voltage controlled tunable filter.

6. (Currently Amended) The voltage-controlled tunable filter of claim 1, wherein said at least one voltage tunable dielectric varactors includes a substrate having a low dielectric constant with planar surfaces.

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7. (Original) The voltage-controlled tunable filter of claim 6, wherein said substrate further includes a tunable dielectric film on the substrate comprising a low loss tunable dielectric material.

8. Cancel claim 8.

9. Cancel claim 9.

10. Cancel claim 10.

11. Cancel claim 11.

12. (Currently Amended) A method of using voltage to control a tunable filter, comprising the steps of:

providing a plurality of coaxial combline resonators;

said plurality of coaxial combline resonators include at least one metallized through-hole and an input/output coupling metallization on at least one surface of said plurality of coaxial combline resonators;

varying the capacitance of a capacitor by using at least one voltage tunable dielectric capacitor associated with ~~said~~ at least one coaxial combline resonator of said plurality of coaxial combline resonators; and

connecting said plurality of coaxial combline resonators with an iris.

13. (Currently Amended) The method of using voltage to control a tunable filter of claim 12, further comprising the step of providing voltage to said at least one voltage tunable dielectric varactor with at least one DC biasing point.

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14. (Original) The method of using voltage to control a tunable filter of claim 12, further comprising the step of controlling the coupling between adjacent resonators by controlling the aperture size and position of said iris formed on a common wall between the resonators.

15. (Original) The method of using voltage to control a tunable filter of claim 12, wherein said at least one input/output coupling metallization on at least one surface of said at least one coaxial combline resonator is two input/output coupling metallizations on at least one surface of two coaxial combline resonators.

~~14~~16. (Currently Amended) The method of using voltage to control a tunable filter of claim 12, wherein said ~~voltage-controlled~~ tunable filter is a coaxial block voltage controlled tunable filter.

~~15~~17. (Currently Amended) The method of using voltage to control a tunable filter of claim 12, wherein said voltage tunable dielectric capacitors include a substrate having a low dielectric constant with planar surfaces.

~~16~~18. (Currently Amended) The method of using voltage to control a tunable filter of claim 15, wherein said substrate further includes a tunable dielectric film on the substrate comprising low loss tunable dielectric material.

~~17~~19. Cancel claim 19.

~~18~~20. Cancel claim 20.

~~19~~21. Cancel claim 21.

~~20~~22. Cancel claim 22.